

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 February 2005 (17.02.2005)

PCT

(10) International Publication Number
WO 2005/015489 A1

(51) International Patent Classification⁷:
H01L 29/15, G01R 29/24

G06N 1/00,

(74) Agent: F B RICE & CO; 605 Darling Street, Balmain,
NSW 2041 (AU).

(21) International Application Number:
PCT/AU2004/001067

(22) International Filing Date: 10 August 2004 (10.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003904256 11 August 2003 (11.08.2003) AU

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (for all designated States except US): QUCOR
PTY LTD [AU/AU]; Rupert Myers Building, Gate 14,
Barker Street, UNSW, Sydney, NSW 2052 (AU).

(72) Inventors; and

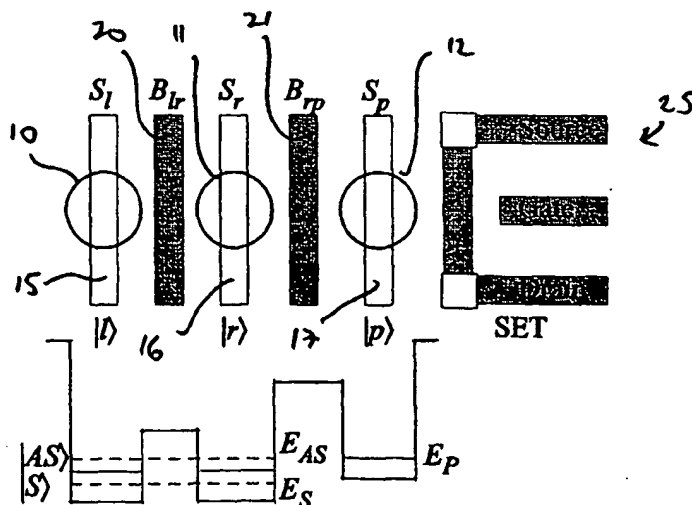
(75) Inventors/Applicants (for US only): GREENTREE,
Andrew, D. [AU/AU]; 23 Donne Street, Coburg, VIC
3058 (AU). HAMILTON, Alexander, R. [GB/AU];
7/106 Mount Street, Coogee, NSW 2034 (AU). GREEN,
Frederick [AU/AU]; 14 Pritchard Street, Annandale, NSW
2038 (AU). HOLLENBERG, Lloyd, C., L. [AU/AU];
Unit 28/22 Bosista Street, Richmond, VIC 3121 (AU).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: QUBIT READOUT VIA CONTROLLED COHERENT TUNNELLING TO PROBE STATE



(57) Abstract: This invention concerns quantum computers in which the qubits are closed systems, in that the particle or particles are confined within the structure. A "site" can be produced by any method of confining an electron or other quantum particle, such as a dopant atom, a quantum dot, a cooper pair box, or any combination of these. In particular the invention concerns a closed three-site quantum particle system. The state in the third site is weakly coupled by coherent tunnelling to the first and second states, so that the third state is able to map out the populations of the first and second states as its energy is scanned with respect to the first and second states. In second and third aspects it concerns a readout method for a closed three-state quantum particle system.